

CLAIMS

1. A method of storing and dispensing a first gas for use in a process and receiving and storing a second gas, said method comprising the steps of  
5 storing the first gas in the first compartment of a container having a first compartment and a second compartment separated by a movable gas impermeable partition,

dispensing the first gas from the first compartment via a gas outlet of the container and providing the first gas to a processing apparatus for carrying out  
10 a process involving the first gas;

recovering gas from said processing apparatus; and

feeding at least a portion of said recovered gas to the second compartment via a gas inlet of the container to provide at least a portion of the second gas, whereby a volume of the second gas displaces a volume of the first  
15 gas by movement of the partition to enlarge the second compartment relative to the first compartment.

2. A method as claimed in Claim 1, wherein the container has a rigid housing with a flexible internal membrane dividing the housing into the first and  
20 second compartments.

3. A method as claimed in Claim 1 or Claim 2, wherein at least a portion of the second gas is a component of the first gas.

25 4. A method as claimed in any one of the preceding claims, which further comprises the steps of analysing the recovered gas and feeding to the second compartment at least a portion of the recovered gas that satisfies at least one predetermined criterion determined by said analysis.

30 5. A method as claimed in any one of the preceding claims, wherein the pressure of gas in the second compartment is maintained above 0.1 MPa (1 atmosphere).

6. A method as claimed in any one of the preceding claims, wherein the first gas comprises a noble gas, a noble gas isotope, an isotope of oxygen or an isotope of carbon dioxide.

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7. A method as claimed in any one of the preceding claims, wherein the first gas comprises xenon.

8. A method as claimed in Claim 7, wherein the first gas comprises  
10 xenon in an amount of at least about 50% by volume.

9. A method as claimed in Claim 7 or Claim 8, wherein the first gas further comprises oxygen.

15 10. A method as claimed in Claim 9, wherein the xenon and oxygen are the sole components of the first gas.

11. A method as claimed in any one of claims 7 to 10, wherein the  
second gas comprises xenon.

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12. A method as claimed in any one of the preceding claims, wherein the processing apparatus is a cardiopulmonary bypass oxygenator or an artificial ventilator.

25 13. Use of a container for storing and dispensing a gas for use in a process and receiving and storing a gas recovered from the process, wherein the container comprises a first compartment having a gas outlet and a second compartment having a gas inlet, said first and second compartments separated by a gas impermeable partition, wherein said partition is moveable such as to enable  
30 the relative volumes of the first and second compartment to be varied.

14. A use as claimed in Claim 13, wherein the container has a rigid housing and the gas impermeable partition is a flexible membrane dividing the housing into the first and second compartments..

5 15. Apparatus for storing and dispensing a gas for use in a process and receiving and storing a gas recovered from the process, said apparatus comprising

a container, which container comprises

10 a first compartment for containing a first gas and having a gas outlet;

a second compartment for containing a second gas and having a gas inlet; and

15 a gas impermeable partition which separates the first compartment and the second compartment and is moveable such as to enable the relative volumes of the first and second compartments to be varied;

a processing apparatus for carrying out a process involving a gas;

a dispensing conduit for feeding gas from the gas outlet to the processing apparatus;

20 a recovery conduit for feeding gas from the processing apparatus to the gas inlet; and

a pumping means for pumping the gas from the processing apparatus into the second compartment.

25 16. An apparatus as claimed in Claim 15, wherein the container has a rigid housing with a flexible internal membrane dividing the housing into the first and second compartments..

30 17. An apparatus as claimed in Claim 15 or Claim 16, wherein the processing apparatus is an artificial ventilator.

18. An apparatus as claimed in Claim 15 or Claim 16, wherein the processing apparatus is a cardiopulmonary bypass oxygenator.